SECTION – IV
(VOLUME-I)

ERECTION CONDITIONS OF CONTRACT
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ERECTION CONDITIONS OF CONTRACT

1.0 GENERAL:

1.1 The following shall supplement the condition, already contained in the other parts of these specifications and document and shall govern the, portion of the work of this contract to be performed at Site.

1.2 The Contractor upon signing of the contract shall, in addition to a project coordinator, nominate another responsible officer as his representative at site, suitably designated for the purpose of overall responsibility and coordination of the works to be performed at site. Such persons shall function from the site office of the Contractor during the pendency of contract.

2.0 REGULATION OF LOCAL AUTHORITIES AND STATUTES:

2.1 The Contractor shall comply with all the rules and regulations of local authorities during the performance of his field activities. He shall also comply with all labour laws including the Minimum Wages Act, 1948, the Payment of Wages Act and the rules made there under in respect of any employee or workman employed or engaged by him or his Sub-Contractor.

2.2 All registration and statutory inspection fees, if any in respect of his work pursuant to this contract, shall be to the account of the Contractor. However any registration/statutory inspection fees lawfully payable under any statutory laws and its amendments from time to time during erection in respect of the equipment, ultimately to be owned by the Employer, shall be to the account of the Employer. Should any such inspection or registration need to be rearranged due to the fault of the Contractor or his Sub-Contractors, the additional fees to such inspection and/or registration shall be borne by the Contractor.

3.0 EMPLOYER'S LIEN ON EQUIPMENT:

The Employer shall have lien on all equipment including those of the contractor brought to the site for the purpose of erection, testing and commissioning of the equipment to be supplied (either Employer Supplied or Contractor Supplied) and erected under the contract. The Employer shall continue to hold the lien on all such equipment throughout the period of contract. no material bought to the site shall be removed from the site by the

contractor and or is Sub-Contractor without the prior written approval of the Engineer

4.0 INSPECTION, TESTING & INSPECTION CERTIFICATES:

The provision of the clause entitled inspection, testing and inspection certificates under technical specification shall also be applicable to the erection portion of the works. The Engineer shall have the right to re-inspect any equipment though previously inspected and approved by him at the Contractor's works before and after the same are erected at site. If by the above inspection, the Engineer rejects any equipment, the contractor shall make good for such rejections either by replacement or modification/ repairs as may be necessary to the satisfaction of the Engineer. Such replacements will also include the replacements or re-execution of such of those works of other Contractors and/or agencies which might have got damaged or affected by the replacement or re-work done to the Contractor's Work.

5.0 ACCESS TO SITE AND WORKS ON SITE:

5.1 Suitable access to and possession of the site shall be offered to the Contractor by the Employer in reasonable time.

5.2 The works, so far as it is carried out on the Employer's premises, shall be carried out at such time as the Employer may approve and the Employer shall give the Contractor reasonable facilities for carrying out the works.

5.3 In the execution of the works, no persons other than the Contractor or his duly appointed representative, sub-contractor and workman, shall be allowed to do work on the site, except by the special permission, in writing of the engineer or his representative.

6.0 CONTRACTOR'S SITE OFFICE ESTABLISHMENT:

The Contractor shall establish a site office at the site and keep posted an authorised representative for the purpose of the contract. Any written order or instruction of the Engineer or his duly authorised representative shall be communicated to the said authorised resident representative of the Contractor and the same shall be deemed to have been communicated to the Contractor at his legal address.

7.0 CO-OPERATION WITH OTHER CONTRACTORS:

7.1 The Contractor shall co-operate with all other Contractors or tradesmen of the Employer, who may be performing other works, on behalf of the Employer and the workmen who may be employed by the Employer and doing work in the vicinity of the works under the contract. The Contractor shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference- with the work of other Contractors and their workmen. Any injury or damage that may be sustained by the Employees of the other Contractors and the Employer, due to the Contractor's work shall promptly be made good at the Contractor's own expense. The Engineer shall determine the resolution of any difference or conflict that may arise between the Contractor and the workmen of the Employer in regard to their work. If the work of the Contractor is delayed because of any set of omission of another Contractor the Contractor shall have no claim against the Employer on that account other than an extension of time for completing his works.

7.2 The Engineer shall be notified promptly by the Contractor of any defects in the other Contractor's works that could affect the Contractor's works. The Engineer shall determine the corrective measures, if any, required to rectify this situation after inspection of the works and such decision by the Engineer shall be binding on the Contractor.

8.0 DISCIPLINE OF WORKMEN:

The Contractor shall adhere to the disciplinary procedure set by the Engineer in respect of his Employees and workmen at site. The Engineer shall be at liberty to object to the presence of any representative or employee of the Contractor at the site, if in the opinion of the Engineer such Employee has misconduct or is incompetent or negligent or otherwise undesirable and then the Contractor shall remove such persons objected to and provide in his place a competent replacement.

9.0 CONTRACTOR'S FIELD OPERATION:

9.1 The Contractor shall keep the Engineer informed, in advance, regarding his field activity plans and schedules for carrying out each part of the works. Any review of such plan or schedule or method of work by in Engineer shall not relieve the Contractor of any of his responsibilities towards the field activities. Such reviews shall also not be considered as an assumption of any

risk or liability by the Engineer or the Employer or any of his representatives and no claim of the Contractor will be entertained because of the failure or inefficiency of any such plan or schedule, or method of work reviewed. The Contractor shall be solely responsible for the safety adequacy and efficiency of plant and equipment and his erection methods.

9.2 The Contractor shall have the complete responsibility for conditions of the work site including the safety of all persons employed by him or his Sub-Contractor and all the properties under his custody during the performance of the work. This requirement shall apply continuously till the completion of the contract and shall not be limited to normal working hours. The construction review by the Engineer is not intended to include review of Contractor's safety measures in or near the work-site and their adequacy or otherwise.

10.0 PHOTOGRAPHS AND PROGRESS REPORT:

10.1 The Contractor shall furnish three (3) prints each of the photographs on progress of the work done at site to the engineer. Photographs shall be taken as and when indicated by the engineer or his representative. Photographs shall be adequate in size and number to indicate various stages of erection. Each photograph shall contain the date, the name of the Contractor and the title of the photograph.

10.2 The above photographs shall accompany the monthly progress report detailing out the progress achieved on all erection activities as compared to the schedules. The report shall also indicate the reasons for the variance between the scheduled and actual progress and the action proposed for corrective measures, wherever necessary.

11.0 MAN POWER REPORT:

11.1 The Contractor shall submit to the Engineer, on the first day of every month, a man-hour schedule for the month, detailing the man-hours scheduled for the month, skill-wise and area-wise.

11.2 The Contractor shall also submit to the Engineer, on the first day of every month, a man power report of the previous month detailing the number of persons scheduled to have been employed and actually employed, skill wise and the area of employment of such labour.

12.0 PROTECTION OF WORKS:

The Contractor shall have total responsibility for protecting his works till it is finally taken over by the Engineer. No claim will be entertained by the Employer or by the Engineer for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings, should any such damage to the Contractor's Works occur because of any other party not being under his supervision or control. The Contractor shall make his claim directly with the party concerned. If disagreement or conflict or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damages to the contractor works, the same shall be resolved as per the provisions of the clause 7.0 above entitled "Cooperation with other Contractors". The Contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such dispute. The Contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.

13.0 EMPLOYMENT OF LABOUR:

13.1 The Contractor shall employ on the work, only his regular skilled employees with experience of his particular Work and in accordance with law.

13.2 All traveling expenses including provisions of all necessary transport to and from site, lodging allowances and other payments to the Contractor's employees shall be the sole responsibility of the Contractor,

13.3 The hours of work on the site shall be decided by the Employer and the Contractor shall adhere to it. Working hours will normally be eight (8) hours per day - Monday to Saturday.

13.4 The Contractor's Employees shall wear identification badges while on work at site.

14.0 FACILITIES TO BE PROVIDED BY THE EMPLOYER.

14.1 **Space:**

Land for Contractor's Office, Store and Workshop etc.

a) The Engineer shall at his discretion and subject to availability for the duration of execution of the contract make available at site, land for construction of Contractors field Office, Workshop, Stores, Magazines for explosives in isolated locations, assembling yard, etc., required for execution of the contract. Any construction of temporary roads, Offices, Workshop, etc., as per plan approved by the engineer shall be done by the contractor at his cost.

b) On completion of work, the Contractor shall hand over the land duly cleaned to the Engineer. Until and unless the Contractor has handed over the vacant possession of land allotted to him for the above purpose, the payment of his final bill shall not be made. The Contractor shall be made liable to pay for the use and occupation at the rates to the determined by the Engineer if the Contractor over stays in the land after the contract is completed.

14.2 **Electricity:**

The Contractor shall make his own arrangements for electrical power required for construction purposes as well as for its staff labour colony.

14.3 **Water:**

The Contractor shall make his own arrangement for the water for construction / drinking purposes both at site and for his staff / labour colony.

15.0 FACILITIES TO BE PROVIDED BY THE CONTRACTOR:

15.1 **Tools, Tackles and Scaffoldings:**

The Contractor shall provide all the construction equipment, tools, tackles and scaffoldings required for preassembly, erection, stringing, testing and commissioning of the sub-stations / transmission lines including all equipments / materials covered under the contract. He shall submit a list of all such materials to the engineer before the commencement of pre assembly at site. These tools and tackles shall not be removed from the site without the written permission of the Engineer.

15.2 **Communication:**

The Employer will extend the telephone, telex and fax facilities, if available at site, for purposes of the contract. The Contractor shall be charged at actual for such facilities. The Contractor shall arrange to provide communication facilities himself if they are not provided by the Employer due to non-availability at site.

15.3 **First-Aid:**

The Contractor shall provide necessary first-aid facilities for all his employees, representatives and workmen working at the site. Enough number of Contractor's personnel shall be trained in administering first aid.

15.4 **Cleanliness:**

The Contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc., during the period of contract. The Contractor shall employ enough number of special personnel to thoroughly clean his work area at least once in a day. All such rubbish and scrap material shall be stocked or disposed in a place to be identified by the Engineer. Materials and stores shall be so arranged to permit easy cleaning of the area. In areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.
Similarly the labour colony, the offices and the residential areas of the Contractor's Employees and workmen shall be kept clean and neat to the entire satisfaction of the Engineer. Proper sanitary arrangements shall be provided by the Contractor, in the work-areas, office and residential areas of the Contractor.

15.5 **The contractor shall pay a non-refundable contract management fee as mentioned in the e-Procurement portal. The contractor shall use the contract management module of e-Procurement system from the stage of signing of Contract till the approval of bills / invoices submitted in the e-Procurement system. Contractors can avail free training facilities on all working Saturdays in Centre for e-Governance, Bangalore.**

16.0 LINES AND GRADES:

All the works shall be performed to the lines, grades and elevations indicated on the drawings. The Contractor shall be responsible to locate and layout the works. Basic horizontal and

vertical control points will be established and marked by the engineer at site at suitable points. These points shall be used as datum for the works under the contract. The Contractor shall inform the Engineer well in advance of the times and places at which he wishes to do work in the area allotted to him so that suitable datum points may be established and checked by the engineer to enable the Contractor to proceed with his works. Any work done without being properly located may be removed and/or dismantled by the Engineer at Contractor's expense.

17.0 FIRE PROTECTION:

17.1 The Work procedures that are to be used during the erection shall be those, which minimize fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the site at least once each day. Fuels, oils and volatile or inflammable materials shall be stored away from the construction and equipment and materials storage areas in safe containers. Un-treated materials shall not at all be used at site for any other purpose unless otherwise specified. If any such materials are received with the equipment at the site, the same shall be removed and replaced with acceptable materials before moving into the construction or storage area.

17.2 Similarly corrugated paper fabricated cartons etc., will not be permitted in the construction area either for storage or for handling of materials. All such materials used shall be of waterproof and flame resistant type. All the other materials such as working drawings, plans etc. which are combustible but are essential for the works to be executed shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.

17.3 All the Contractor's supervisory personnel and sufficient number of workers shall be trained for firefighting and shall be assigned specific fire protection duties. Enough of such trained personnel must be available at the site during the entire period of the contract.

17.4 The Contractor shall provide enough fire protection equipment of the types and number for the warehouses, office, temporary structures, labour colony area etc. Access to such fire protection equipment shall be easy and kept open at all times.

18.0 SECURITY:

The Contractor shall have total responsibility for all equipment and materials in his custody/stores - loose, semi assembled and/or erected by him at site. The Contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the project site only with the written permission of the Engineer in the prescribed manner.

19.0 CONTRACTOR'S AREA LIMITS:

The Engineer will mark-out the boundary limits of access roads, parking spaces, storage and construction areas for the contractor and the contractor shall not trespass the area not so marked out for him. The Contractor shall be responsible to ensure that none of his personnel move out of the areas marked out for his operations. In case of such a need for the Contractor's Personnel to work out of the areas marked out for him, the same shall be done only with the written permission of the Engineer.

20.0 CONTRATORS CO-OPERATION WITH THE EMPLOYER:

In case where the performance of the erection work by the contractor affects the operation of the system facilities of the Employer, such erection work of the Contractor shall be scheduled to be performed only in the manner stipulated by the Engineer and the same shall be acceptable at all times to the Contractor. The Engineer may impose such restrictions on the facilities provided to the Contractor such as electricity, water, etc., as he may think fit in the interest of the Employer and the Contractor shall strictly adhere to such restrictions and co-operate with the Engineer. It will be the responsibility of the Contractor to provide all necessary temporary instrumentation and other measuring devices required during start-up and operation of the equipment systems, which are erected by him.

21.0 PRE-COMMISSIONING TRIALS AND INITIAL OPERATIONS:

The pre-commissioning trials and initial operations of the equipment erected by the Contractor shall be the responsibility of the Contractor as detailed in relevant clauses in technical

specification. The Contractor shall provide, in addition, test instruments, calibrating devices etc., and labour required for successful performance of these trials. If it is anticipated that the above test may prolong for a long time, the Contractor's workmen required for the above test shall always be present at site during such trials.

22.0 MATERIALS HANDLING AND STORAGE:

22.1 All the equipment furnished under the contract and arriving at site shall be promptly received, unloaded, transported and stored in the storage spaces by the Contractor.

22.2 Contractor shall be responsible for examining all the shipment and notify the Engineer immediately of any damage, shortage, discrepancy etc., for the purpose of Engineer's information only. The Contractor shall submit to the Engineer every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damage in transit, handling and/or in storage and erection of the equipment at site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc., shall be to the account of the Contractor.

22.3 The Contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the engineer-charge.

22.4 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings, etc., shall be used for unloading and/or handling of the equipment without the specific written permission of the Engineer. All equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.

22.5 All electrical panels, control gears, motors and such other devices shall be properly dried by heating before they are installed and energized.

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22.6 The Contractor shall ensure- that all the packing materials and protection device used for the various equipment/material

transit and storage are removed before the equipment are installed.

22.7 The consumables and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage.

22.8 All the materials stored in the open or dusty location must be covered with suitable weatherproof and flame proof covering materials wherever applicable.

22.9 If the materials belonging to the Contractor are stored in areas other than those earmarked for him, the Engineer will have the right to get it moved to the area earmarked for the Contractor at the Contractor's cost.

22.10 The Contractor shall be responsible for making suitable indoor storage facilities to store all equipment which require indoor storage, normally, all the electrical equipment such as motors, control gear, generators, exciters and consumables like electrodes, lubricants etc,, shall be stored in the closed storage space. The Engineer, in addition, may direct the Contractor to move certain other materials, which in his opinion will require indoor storage, to storage areas, which the Contractor shall strictly comply with.

23.0 **CONSTRUCTION MANAGEMENT:**

23.1 The field activities of the Contractors working at site will be coordinated by the Engineer and the Engineer's decision shall be final in resolving any disputes or conflicts between the Contractor and other Contractors and tradesmen of the Employer regarding scheduling and coordination of work. Such decision by the Engineer shall not be a cause for extra compensation or extension of time for the Contractor.

23.2 The Engineer shall hold weekly meetings of all the Contractors working at site, at a time and place to be designated by the Engineer. The Contractor shall attend such meetings and take notes of discussions during the meeting and the decision in performing his works. In addition to the above weekly meeting, the Engineer may call for other meeting, either with individual Contractors or with selected number of Contractors and in such a case the Contractor if called, will also attend such meeting.

23.3 Time is the essence of the contract and the Contractor shall be responsible for performance of his works in accordance with the specified construction schedule. If at any time, the Contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate such actions in writing to the Engineer, satisfying that his action will compensate for the delay. The Contractor shall not be allowed any extra compensation for such action.

23.4 The Engineer shall, however, not be responsible for provision of additional labour and/or materials or supply or any other services to the Contractor except for the co-ordination work between various Contractors as set out earlier.

24.0 FIELD OFFICE RECORDS:

The Contractor shall maintain, at his site office, up to date copies of all drawings, specifications and other contract documents and any other supplementary data complete with all the latest revisions thereto. The Contractor shall also maintain, in addition, the continuous record of all changes to the above contract documents, drawing, specifications, supplementary data, etc., effected at the field and on completion of his total assignment under the contract shall incorporate all such changes on the drawings and other engineering data to indicate as installed conditions of the equipment furnished and erected under the contract, such drawings and engineering data shall be submitted to the engineer in required number of copies.

25.0 CONTRACTORS MATERIALS BROUGHT ON TO SITE:

25.1 The Contractor shall bring to site all equipment, components, parts, materials, including construction equipment, tools and tackles for the purpose of the works under intimation to the Engineer. All such goods shall, from the time of their being brought, vest with the Employer, but may be used for the purpose of the works only and shall not on any account be removed or taken away by the Contractor without the written permission of the Engineer. The Contractor shall nevertheless be solely liable and responsible for any loss or destruction thereof and damage, thereto.

25.2 The Employer shall have a lien on such goods for any sum or sums which may, at any time, be due or owing to him by the

Contractor, under, in respect of or by reasons of the contract. After giving fifteen (15) days' notice in writing of his intention to do so, the Employer shall be at liberty to sell and dispose off any such goods, in such manner as he shall think fit including public auction or private treaty and to apply the proceeds in or towards the satisfaction of such sum or sum due as aforesaid.

25.3 After the completion of the works, the Contractor shall remove from the site under the direction of the engineer the materials such as construction equipment, erection tools and tackles, scaffolding etc., with the written permission of the Engineer. If the Contractor fails to remove such materials, within fifteen (15) days of issue of the notice by the engineer to do so, then the engineer shall have the liberty to dispose of such materials as detailed under clause 25.2 above and credit the proceeds there to the account of the Contractor.

26.0 PROTECTION OF PROPERTY AND CONTRACTOR'S LIABILITY:

26.1 The Contractor shall be responsible for any damage resulting from his operations. He shall also be responsible for protection of all persons including members of public and employees of the Employer and the employees of other Contractors and Sub-Contractors and all public and private property including structures, building, other plants and equipments and utilities either above or below the ground.

26.2 The Contractor will ensure provision of necessary safety equipment such as barriers, signboards, warning lights and alarms, etc., to provide adequate protection to persons and property. The Contractor shall be responsible to give reasonable notice to the Engineer and the Employer of public/private property and utilities when such property and utilities are likely to get damaged or injured during the performance of his works and shall make all necessary arrangements with such Employers related to removal and or replacement or protection of such property and utilities.

27.0 PAINTING

All exposed metal parts of the equipment including piping, structures, railing etc., wherever applicable, after installation, unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt,

rust, scales, grease, oil and other foreign materials by wire brushing, scrapping or sand blasting and the same being inspected and approved by the Engineer for painting. Afterwards, the above parts shall be painted with two coats of allowed resin machinery enamel paints. The quality of the finish paint shall be as per the standards of IS or equivalent and shall be of the colour as approved by the Engineer.

28.0 INSURANCE:

28.1 In addition to the condition covered under the clause entitled "Insurance" in general terms and conditions of this volume-i, the following provisions will also apply to the portion of works to be done beyond the Contractor's Own or his Sub-Contractor's manufacturing works.

28.2 Workmen's Compensation Insurance:

This insurance shall protect the contractor against all claims applicable under the Workmen's Compensation Act, 1948. This policy shall also cover the Contractor against claims for injury, disability, disease or death of his or his Sub-Contractor's Employee, which for any reason are not covered under the Workmen's compensation Act, 1948. The liabilities shall not be less than:

Workmen's compensation	-	As per statutory provisions.
Employee's liability	-	As per statutory provisions.

28.3 Comprehensive Automobile Insurance:

This Insurance shall be in such a form to protect the Contractor against all claims for injuries, disability, disease and death to members of public including the Employer's Men and damage to the property of others arising from the use of motor vehicles during on or off the site operations, irrespective of the Employer ship of such vehicles the liability covered shall be as herein indicated:

Fatal Injury	- Rs. 1,00,000 each Persons
	- Rs. 2,00,000 each occurrence
Property Damage	- Rs. 1,00,000 each occurrence

28.4 Comprehensive General Liability Insurance:

The insurance shall protect the Contactor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act or omission on the part of the Contractor, his agents, his Employees, his representatives and Sub-Contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor arising out of the clause entitled 'Defense of Suits' under Section-III, General Terms and Conditions of Contract-GCC, Volume-I.

The hazards to be covered will pertain to all the works hazards where the Contractor, his Sub-Contractors, his agents and his employees have to perform work pursuant to the contract.

28.5 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the Contractors to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the contract.

29.0 UNFAVORABLE WORKING CONDITIONS:

The Contractor shall confine his entire field operations to those, which can be performed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms, etc and during other unfavorable construction conditions. No field activities shall be performed by the Contractor under conditions that might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the Contractor in a proper and satisfactory manner in the performance of such works and with the concurrence of the Engineer. Such unfavorable construction conditions will, in no way, relieve the Contractor of his responsibility to perform the works as per the schedule.

30.0 PROTECTION OF MONUMENTS AND REFERENCE POINTS:

The Contractor shall ensure that any finds such as relic, antiquity, coins, fossils, etc which he may come across during the course of performance of his works, either during excavation or elsewhere, are properly protected and handed over to the Engineer. Similarly the Contractor shall ensure that the benchmarks, reference points, etc which are marked either with the help of Engineer or by the Engineer shall not be disturbed in any way during the performance of his works. If

any Work is to be performed, which disturb such reference, the same shall be done only after these are transferred to other suitable locations under the direction of the Engineer. The Contractor shall provide all necessary materials and assistance for such relocation of reference points etc,

31.0 WORK & SAFETY REGULATIONS:

31.1 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipments belonging to him or to BWSSB or to others working at the site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislation and the Engineer, as he may deem necessary.

31.2 The Contractor will notify well in advance to the Engineer of his intention to bring to the site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals, which may involve hazards. The Engineer shall have the right to prescribe the conditions, under which such container to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Engineer shall have the right, at his sole discretion, to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by the Employer and the Employer shall not entertain any claim of the Contractor towards additional safety provisions/ conditions to be provided for/constructed as per the Engineer's instructions. Further, any such decision of the Engineer shall not, in any way, absolve the Contactor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Engineer, the Contractor shall use alternative methods with the approval of the Engineer without any cost implication to BWSSB or extension of work schedule.

31.3 Where it is necessary to provide and/or store Petroleum products or Petroleum Mixtures and Explosives, the Contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act, 1948, and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer. In case, any approvals are necessary from the

Chief Inspector (Explosives) or any statutory authorities, the Contactor shall be responsible for obtaining the same.

31.4 All Equipment used in construction and erection by Contractor shall meet Indian/ International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipments shall be strictly operated and maintained by the contractor in accordance with Manufacturer's Operation manual and safety instructions and as per guidelines/ rules of BWSSB in this regard.

31.5 Periodical examinations and all tests for all lifting/ hoisting equipment and tackles shall be carried out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and Associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer or by the persons authorized by him.

31.6 The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractors radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures, stipulated by BARC/DAE in connection with use, storage and handling of such material shall be taken by Contractor.

31.7 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Engineer who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.

31.8 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person, strictly in accordance with the code of practices/rules framed under Indian Explosives Act pertaining to handling, storage and use of explosive.

31.9 The Contractor shall provide safe working conditions to all workmen and employees at the site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of experienced and competent persons. For erection, good and standard quality of material only shall be used by the Contractor.

31.10 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by BWSSB Engineer to handle such fuses, wiring or electrical equipment.

31.11 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contactor or Employer, he shall

a) Satisfy the Engineer that the appliance is in good working condition.
b) Inform the Engineer, of the maximum current rating, voltage and phase of the appliances.
c) Obtain permission of the Engineer detailing the sockets to which the appliances may be connected.

31.12 The Engineer will not grant permission to connect until he is satisfied that:

a) The Appliance is in good condition and is fitted with suitable plug

b) The appliance is fitted with a suitable cable having two earth conditions, one of which shall be an earthed metal sheath surrounding the cores.

31.13 No electric cable in use by the Contractor/Employer will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.

31.14 No repair work shall be carried out on any live equipment. The equipment must be declared ‘Safe’ by the Engineer and a ‘Permit to Work’ shall be issued by the Engineer before any repair work is carried out by the Contractor. While working on electric lines/equipments whether live or dead, suitable type and sufficient quantity of tools will have to be provided by Contractor to Electricians/Workmen/Officers

31.15 The Contractor shall employee necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installations.

31.16 The Contractor employing more than 20 workmen whether temporary, casual, probationer, regular or permanent or on

contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the project safety officer. In case of work being carried out through Sub-Contractors, their workmen/employees will also be considered as the Contractor's Employees/Workmen for the above purpose. The name and address of such safety officer of contractor will be promptly informed in writing to Engineer with a copy to safety officer in-charge before he starts work or immediately after any change of the incumbent is made during currency of the contract. The Contractor shall comply with all the Statutory obligations.

31.17 In case any accident occurs during the construction/ erection or other associated activities undertaken by the Contractor, thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the contractor to promptly inform the same to the engineer in prescribed form and also to all the authorities envisaged under the applicable laws.

31.18 The Engineer shall have the right, at his sole discretion, to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipments. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove the short-comings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Engineer within 3 days of such stoppage of work and decision of the Engineer in this respect shall be conclusive and binding on the Contractor.

31.19 The Contractor shall not be entitled for any damages/ compensation for stoppage of work due to safety reasons as provided in para-31.18 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of Levy of **Penalties**.

31.20 It is mandatory for the Contractor to observe during the execution of the works, requirements of safety rules which would generally include but not limited to following:

a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.

b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.

c) Under no circumstances shall an Employee hurry or take unnecessary chance when working under hazardous conditions.

d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate firefighting equipment shall be provided at crucial locations.

e) Employees under the influence of any intoxicating beverage, even to the slightest degree, shall not be permitted to remain at Work.

f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.

g) The staircases and passageways shall be adequately lighted.

h) The employees when working around moving machinery must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guardrails or to clean around energized or moving equipment.

i) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.

j) Requirements of ventilation in underwater working to licensed and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.

k) In cases of rock excavation, blasting shall invariably be done through licensed blasters and other precautions during blasting and storage/transport of charge materials shall be observed strictly.

31.21 The Contractor shall follow and comply with all BWSSB safety rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation. In case of any discrepancy between

statutory requirement and BWSSB Safety Rules referred above, the later shall be binding on the Contractor unless the statutory provisions are more stringent.

31.22 If the Contractor fails in providing safe working environment as per BWSSB safety rules or continues the work even after being instructed to stop work by the Engineer as provided in Para 31.18 above, the Contractor shall promptly pay to BWSSB, on demand by the Employer, compensation at the rate of Ps. 5,000/- per day or part thereof till the instructions are complied with and so certified by the Engineer. However, in case of accident taking place, causing injury, to any individual, the provisions contained in para 31.23 shall also apply in addition to compensation mentioned in this para.

31.23 If the Contractor does not take all safety precautions and/or fails to comply with the Safety Rules as prescribed by BWSSB or under the applicable Law for the safety of the equipment and plant and for the safety of personnel and the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other Contractors, or BWSSB employees or any other persons who are at site or adjacent thereto, the contractor shall be responsible for payment of compensation to BWSSB as per the following Schedule:

a) Fatal injury or accident causing death	Rs.1,00,000/-per Persons	These are applicable for Death / injury to any Persons whatsoever.
b) Major injuries or accident causing 25% or more permanent disablement to Workmen or Employees	Rs. 20,000/- per Persons	These are applicable for Death / injury to any Persons whatsoever.

Permanent disablement shall have same meaning as indicated in Workmen's Compensation Act. The Compensation mentioned above shall be in addition to the compensation payable to the Workmen/ Employees under the relevant provisions of the Workmen's Compensation Act and Rules framed there under or any other applicable Laws as applicable from time to time. In case the Employer is made to pay such compensation then the

Contractor is liable to reimburse the Employer such amount in addition to the compensation indicated above.

32.0 CODE REQUIREMENTS:

The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant codes and accepted good engineering practice, the engineer's drawings and other applicable Indian recognized Codes and Laws and Regulations of the Government of India.

33.0 FOUNDATION DRESSING AND GROUTING:

33.1 The surfaces of foundations shall be dressed to bring the top surface of the foundations to the required level, prior to placement of equipment/equipment bases on the foundations.

33.2 All the equipment bases and structural steel base plates, shall be grouted and finished as per these specifications unless otherwise recommended by the equipment manufacturer.

33.3 The concrete foundation surfaces shall be properly prepared by chipping, grinding as required to bring the type of such foundation to the required level, to provide the necessary roughness for bondage and to assure enough bearing strength. All laitance and surface film shall be removed and cleaned.

33.4 Grouting Mix:

The grouting mixture shall be composed of Portland cement, sand and water. The Portland cement to be used shall conform to ISI No. 269 or equivalent. Sand shall conform to ISI No. 383/2386 or equivalent. The grout proportions for flat bases where the grouting space does not exceed 35 mm shall be 50 Kg bag of cement to 75 Kg of sand. Only the required quantity of water shall be added so as to make the mix quaky and flow able and the mix shall not show excess water on top when it is being puddle in place. For thick grout beds up to 65 mm, the amount of sand shall be increased to 105 Kg per bag of cement. Bases which are, hollow and are to be filled full of grouting shall be filled to a level of 25 mm, above the outside rim with a mortar mix in the volumetric proportions of one part of cement and 1.5 part sand and 1.5 part 6 mm granite gravel, An acceptable plasticiser may be added to the grout mixes in a proportion recommended by the plasticisers manufacturer. All such grouts

shall be thoroughly mixed for not less than five minutes in an approved mechanical mixer and shall be used immediately after mixing.

33.5 **Placing of Grout:**

After the base has been prepared, its alignment and level has been checked and approved and before actually placing the grout a low dam shall be set around the base at a distance that will permit pouring and manipulation of the grout. The height of such dam shall be at least 25 mm above the bottom of the base. Suitable side and number of chains shall be introduced under the base before placing the grout, so that such chains can be moved back and forth to Push the grout into every part of the space under the base.
The grout shall be poured either through grout holes provided or shall be poured at one side or at two adjacent sides giving it a pressure need to make the grout move in a solid mass under the base and out in the opposite side. Pouring shall be continued until the entire space below the base is thoroughly filled and the grout stands at least 25 mm higher all around than the bottom of the base. Enough care should be taken to avoid any air or water pockets beneath the bases.

33.6 **Finishing of the Edges of the Grout:**

The poured grout should be allowed to stand undisturbed until it is well set. Immediately thereafter, the dam shall be removed and grout, which extends beyond the edges of the structural or Equipment base, plates, shall be cut off, flushed and removed. The edges of the grout shall then be pointed and finished with 1:2 cement mortar pressed firmly to bond with the body of the grout and smoothened with a tool to present a smooth vertical surface. The Work shall be done in a clean and scientific manner and the adjacent floor spaces, exposed edges of the foundations, and structural steel and equipment base plates shall be thoroughly cleaned of any spillage of the grout.

33.7 **Checking of Equipment after Grouting:**

After the grout is set and cured, the Contractor shall check and verify the alignment of equipments, alignment of shafts of rotating machinery, the slopes of all bearing pedestals,

centering of rotors with respect to their sealing bores, couplings, etc as applicable and the like items to ensure that no displacement has taken place during grouting. The various recorded prior to grouting shall be used during such post grouting checkup and verifications. Such pre and post grout records of alignment details shall be maintained by the Contractor in a manner acceptable to the Engineer.

34.0 COMMISSIONING SPARES:

34.1 It will be the responsibility of the Contractor to provide all commissioning spares required for initial operation till the equipment is declared by the Employer as ready for commissioning. The Contractor shall furnish a list of all commissioning spares within 60 days from the date of letter of award/letter of intent (as applicable) and such list shall be reviewed by the Employer and mutually agreed to. However such review and agreement will not absolve the Contractor of his responsibilities to supply all commissioning spares so that initial operation does not suffer for want of commissioning spares. All commissioning spares shall be deemed to be included in the scope of the contract at no extra Cost to the Employer.

34.2 These spares shall be received and stored by the Contractor at least 3 months prior to the schedule date of commencement of commissioning of the respective equipment and utilized as and when required. The unutilized spares and replaced parts, if any, at the end of successful completion of performance and guarantee test shall be the property of the Contractor and he will be allowed to take these parts back at his own cost with the permission of Engineer.